

What is claimed is:

1.           A magneto-resistive device comprising:  
            a magneto-resistive layer formed on one surface  
5   side of a base and including a free layer; and  
            a single-layer film formed to be in contact with an  
effective region effectively involved in detection of  
magnetism in said magneto-resistive layer without  
overlapping with said effective region,  
10           wherein said single-layer film is formed of an  
insulating material made of an oxide or a nitride including at  
least one element, the atomic weight of said at least one  
element being larger than that of silicon, and  
            said single-layer film excludes a layer for applying  
15   a biasing magnetic field to said free layer.
2.           A magneto-resistive device according to claim 1,  
wherein said insulating material is at least one selected from  
a group consisting of  $\text{TiO}_2$ ,  $\text{MgO}$ ,  $\text{Ta}_2\text{O}_5$  and  $\text{WO}_3$ .
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            a magneto-resistive layer formed on one surface  
side of a base and including a free layer; and  
            a composite-layer film formed to be in contact with  
25   an effective region effectively involved in detection of  
magnetism in said magneto-resistive layer without

overlapping with said effective region,

wherein a layer in said composite-layer film being located closest to said base is formed of an insulating material made of an oxide or a nitride including at least one  
5 element, the atomic weight of said at least one element being larger than that of silicon, and

said composite-layer film excludes a layer for applying a biasing magnetic field to said free layer.

10 4. A magneto-resistive device according to claim 3, wherein said insulating material is at least one selected from a group consisting of  $\text{TiO}_2$ ,  $\text{MgO}$ ,  $\text{Ta}_2\text{O}_5$  and  $\text{WO}_3$ .

5. A magneto-resistive device comprising:  
15 a magneto-resistive layer formed on one surface side of a base and including a free layer; and

a composite-layer film formed to be in contact with an effective region effectively involved in detection of magnetism in said magneto-resistive layer without  
20 overlapping with said effective region,

wherein a layer in said composite-layer film being located closest to said base is formed of an insulating material,

at least one layer in said composite-layer film  
25 except for said layer being located closest to said base is made of a predetermined material including at least one

element, the atomic weight of said at least one element being larger than that of silicon, and

said composite-layer film excludes a layer for applying a biasing magnetic field to said free layer.

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6. A magneto-resistive device according to claim 5, wherein said predetermined material is at least one selected from a group consisting of P, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ga, Ge, As, Zr, Nb, Mo, Tc, Ru, Rh, Pt, Ag, Cd, In, Sn,  
10 Sb, Hf, Ta, W, Re, Os, Ir, Au, Hg, Tl, Pb, Bi, and non-magnetic metals and non-magnetic semiconductors including any one or more of said elements.

7. A magneto-resistive device according to claim 5,  
15 wherein said predetermined material is at least one selected from a group consisting of  $\text{TiO}_2$ ,  $\text{MgO}$ ,  $\text{Ta}_2\text{O}_5$  and  $\text{WO}_3$ .

8. A magneto-resistive device according to claim 1, wherein said effective region is a region in which a current  
20 flows in a direction substantially perpendicular to a film surface of said magneto-resistive layer in said magneto-resistive layer.

9. A magneto-resistive device according to claim 1,  
25 further comprising:

a non-magnetic metal layer having one or more

layers formed on said magneto-resistive layer on the side opposite to said base;

wherein said non-magnetic metal layer is formed such that said non-magnetic layer substantially exactly  
5 overlaps with at least the layer in said magneto-resistive layer furthest away from said base.

10. A magneto-resistive device according to claim 1, wherein said magneto-resistive layer includes a tunnel  
10 barrier layer formed on one surface side of said free layer, a pinned layer formed on one surface side of said tunnel barrier layer opposite to said free layer, and a pin layer formed on one surface side of said pinned layer opposite to said tunnel barrier layer, and  
15 said single-layer film is in contact with an end face of said tunnel barrier layer.

11. A magnetic head comprising:  
a base; and  
20 a magneto-resistive device according to claim 1, said magneto-resistive device being supported by said base.

12. A magnetic head according to claim 11, wherein said single-layer film is in contact with said effective region  
25 on at least one side of said effective region opposite to a magnetic recording medium.

13.       A magnetic head comprising:  
          a base; and  
          a magneto-resistive device according to claim 2,  
5   said magneto-resistive device being supported by said base.

14.       A magnetic head comprising:  
          a base; and  
          a magneto-resistive device according to claim 3,  
10   said magneto-resistive device being supported by said base.

15.       A magnetic head comprising:  
          a base; and  
          a magneto-resistive device according to claim 4,  
15   said magneto-resistive device being supported by said base.

16.       A magnetic head comprising:  
          a base; and  
          a magneto-resistive device according to claim 5,  
20   said magneto-resistive device being supported by said base.

17.       A magnetic head comprising:  
          a base; and  
          a magneto-resistive device according to claim 6,  
25   said magneto-resistive device being supported by said base.

18. A magnetic head comprising:  
a base; and  
a magneto-resistive device according to claim 7,  
said magneto-resistive device being supported by said base.

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19. A head suspension assembly comprising:  
a magnetic head according to claim 11; and  
a suspension for supporting said magnetic head  
mounted near a leading end thereof.

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20. A magnetic disk apparatus comprising:  
a head suspension assembly according to claim 19;  
an arm for supporting said head suspension  
assembly; and

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an actuator for moving said arm to position said  
magnetic head.